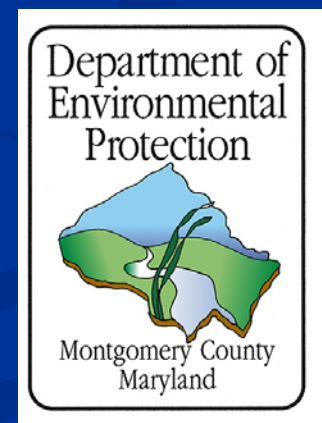


Efforts to Improve Water Quality & Stream Condition in Montgomery County

Doug Marshall, Watershed Planner
John Hollister, Stormwater Engineer



Montgomery County's (NPDES) Permit National Pollutant Discharge Elimination System

- Add stormwater management to currently unmanaged, developed areas
 - Treatment goal is additional 20% of impervious area (4100 acres) currently not treated to the maximum extent practicable (MEP)
- Meet commitments in Trash Free Potomac Treaty
- Increase use of Environmental Site Design (ESD) or Low Impact Development (LID)



Fernwood Road bioswales

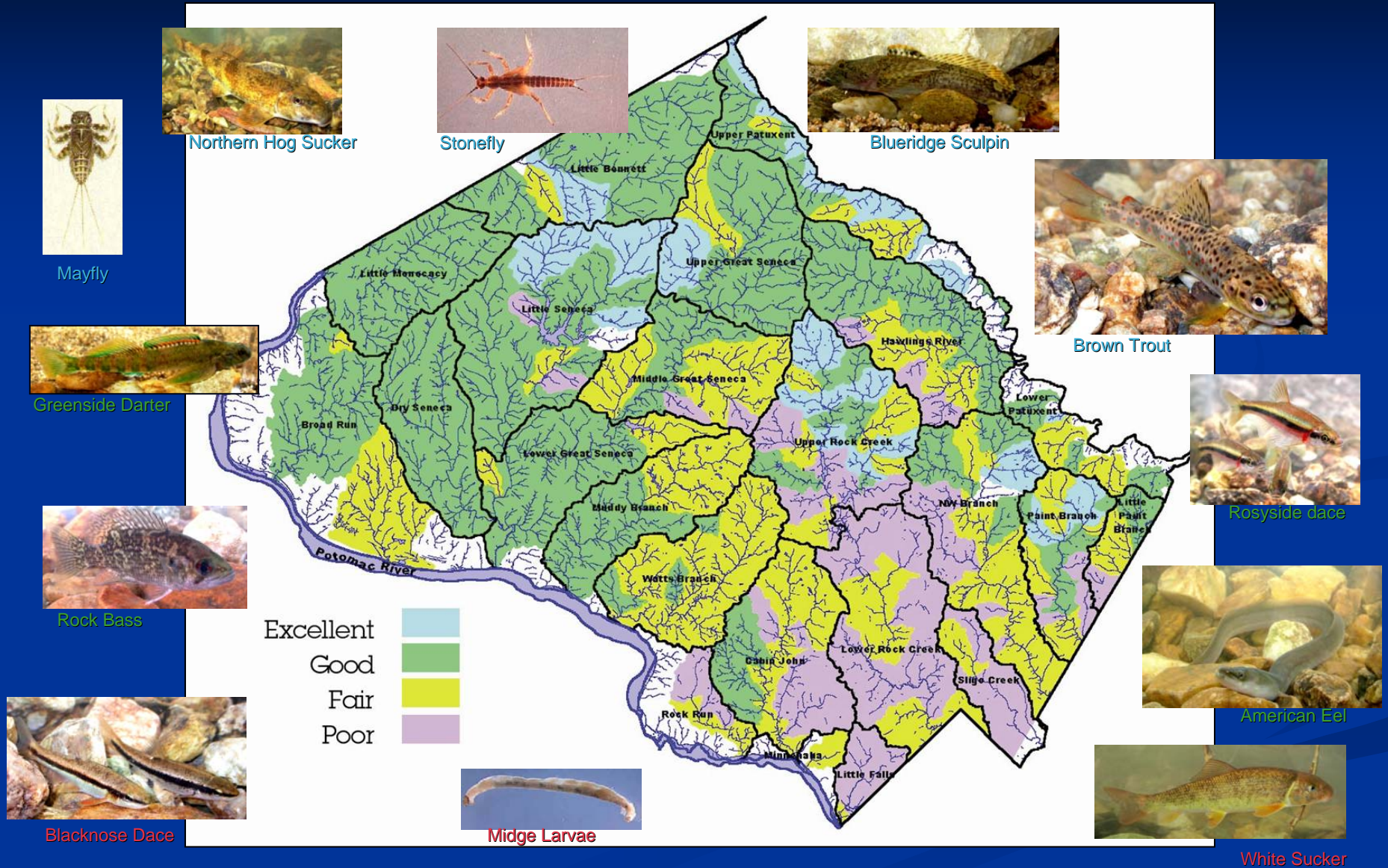


Good Hope pervious concrete sidewalk



Gaithersburg 'Green Street' retrofit

Stream Resource Conditions



There are over 1,500 miles of streams in Montgomery County which contain more than 50 fish species and over 300 aquatic insect taxa

The effects of urban runoff...



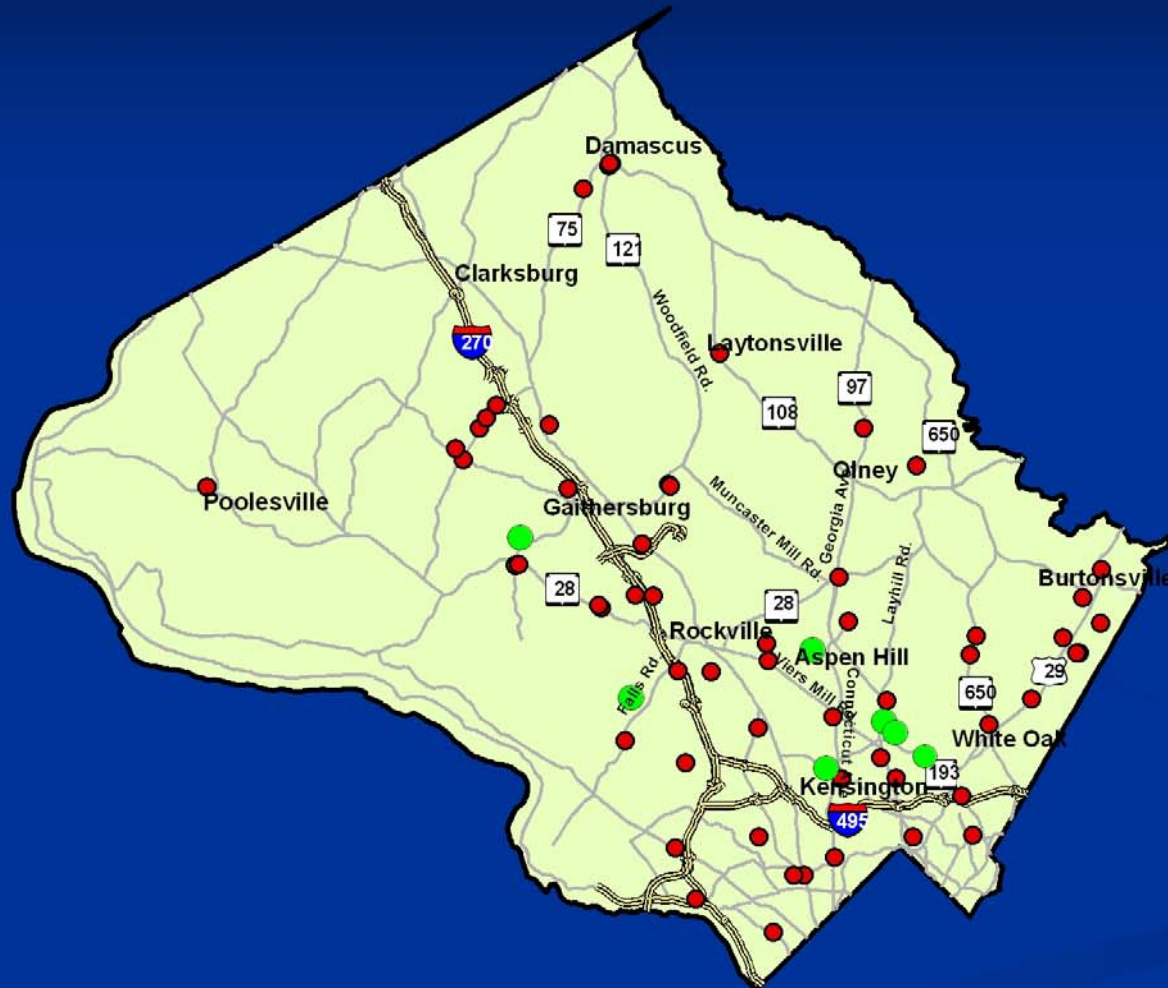
Threats to infrastructure



Down-cut and enlarged, shallow streams



Public Facilities Assessed for LID Retrofit Opportunities



66 Sites Assessed

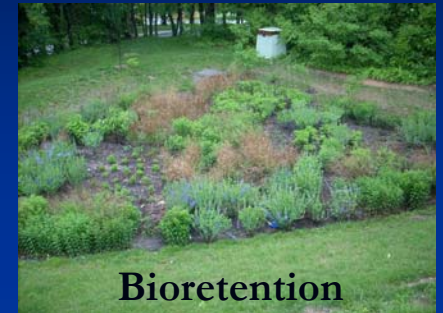
- Libraries - 12
- Community Centers - 11
- Park & Rides - 10
- Regional Service Centers - 9
- Police Stations - 8
- Fire Stations - 5
- Pools - 3
- Schools - 5
- Roadways - 3

In Design (green circles)

- Aspen Hill Library
- Kensington Park Library
- Cold Spring Elem. School
- Ridgeview Middle School
- Arcola Ave.
- Amherst Ave.
- Breewood Neighborhood

What is LID?

- Low Impact Development (AKA - Environmentally Sensitive Design or ESD)
- Uses a variety small scale practices to capture stormwater runoff close to the source
- Slows down the rate of runoff
- Reduces the overall volume of runoff
- Provides filtration to remove pollutants from stormwater runoff
- Provides an opportunity for stormwater to soak into the ground, replenishing ground water.



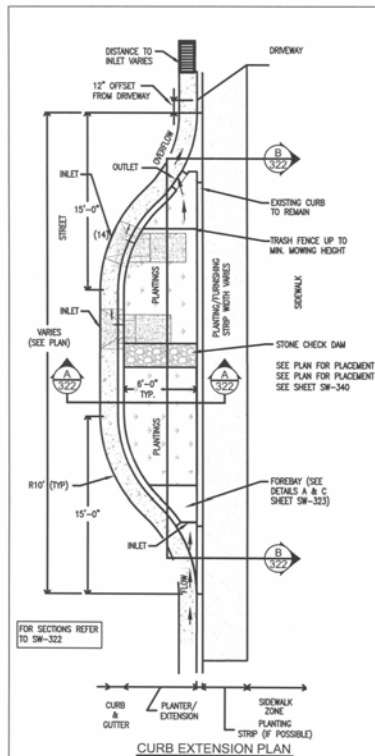
Stormwater Retrofit in White Oak

Lockwood Drive and Stewart Lane



- Retrofit Will Include; Curb Extensions, Roadside Bioswales and Modified Inlets
- All Retrofit Practices Combined Will Treat 13 Acres of Imperviousness
- Phase II Projects are Pending Agreement with WSSC
- Construction of Phase I is Expected to Begin Summer 2010

Curb Extension



NOTES:

1. Width of curb extension to be six (6) feet typical from inside face of curbs. Depth of curb extension to be six (6) inches (min.) from inlet at gutter pan to bottom of facility.
2. Longitudinal slope of planter should match road grade with a preference toward 0% longitudinal (3% maximum). NM cross slope of soil within planter to be 0%.
3. Check dams required to make up grade: See Sheet SW-340 for detail.
4. Special requirements may be necessary on steep slopes and for facilities designed to include discharge.
5. Include beginning and ending station elevations for each facility. Provide the top and bottom elevation at each station called out for each facility. Include elevations of inlets and outlets.
6. Sidewalk elevation must be set above inlet and outlet elevations to allow overflow to drain to street rather than sidewalk.
7. See Sheet SW-323 for inlet/outlet details.
8. See MCDPS Biofiltration Facility Specifications for Planting Media specifications.
9. Special requirements for water lines, meters, and fire hydrants: See site plan, SW-302, SW-324 or MSHA-UD3 for details.
10. Depending on conditions, utility lines may need to be sleeved.
11. Use standard MC-100.01 with gutter thickened to 12\".
12. Where feasible, width of facility may extend into existing planting strip (remove the existing curb in this case).
13. IMPORTANT: Utility conflicts and existing conditions can create major design variables. Locate existing utilities prior to beginning design.
14. If slope and length allow, add an inlet per SW-330 near downstream end with at least 2\" drop available between gutter and swale elevations.

- DRAWING NOT TO SCALE -

RIGHT - OF - WAY SWM RETROFIT TYPICAL DETAILS

DRAFT 11-30-2009

Curb Extension
In-Street Plan



SW-320



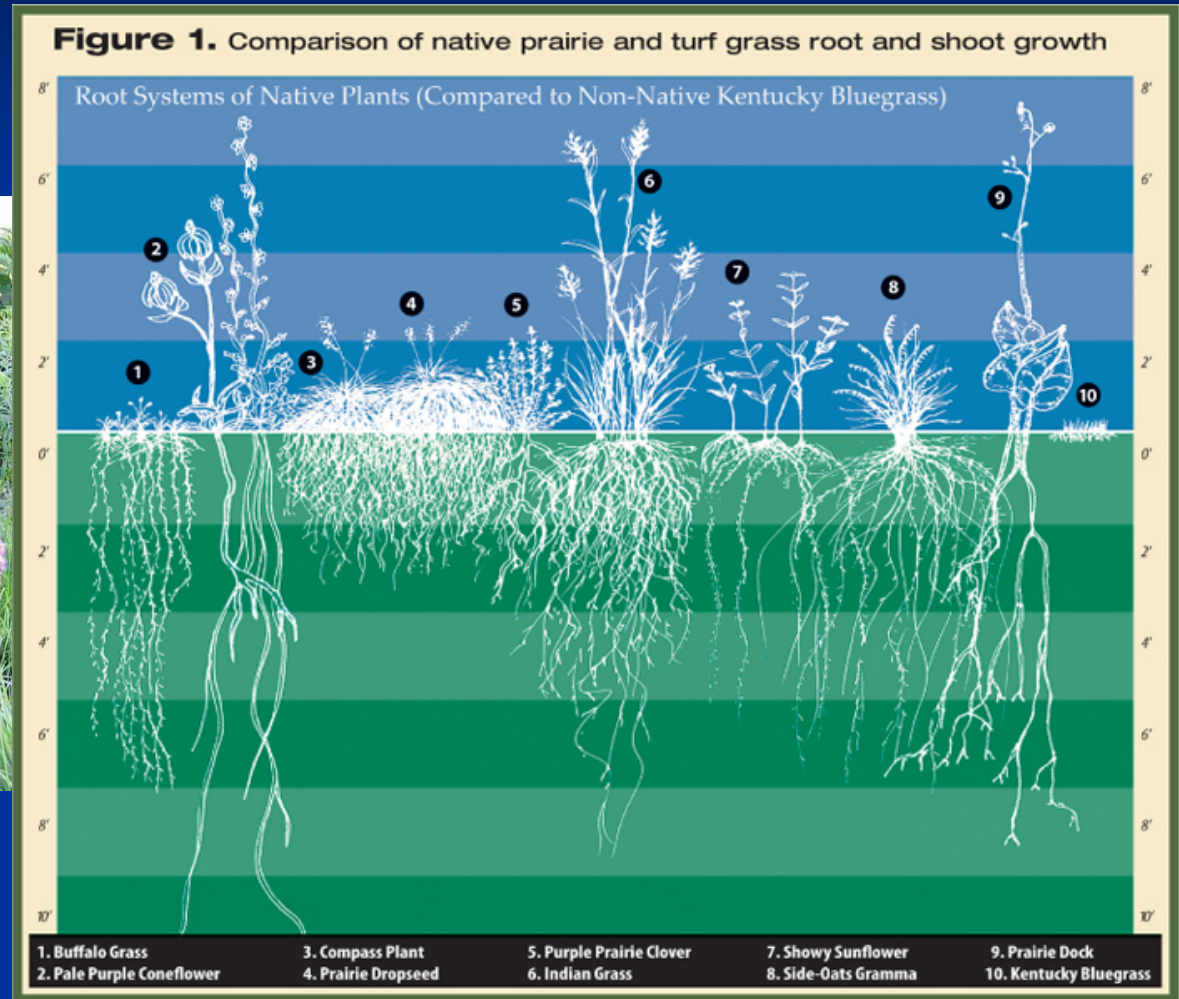
Siskiyou Green Street in Portland, Oregon

Bioswales



Falls Grove Village Center –
near Shady Grove Hospital

Typical Mix of Bioretention Plants



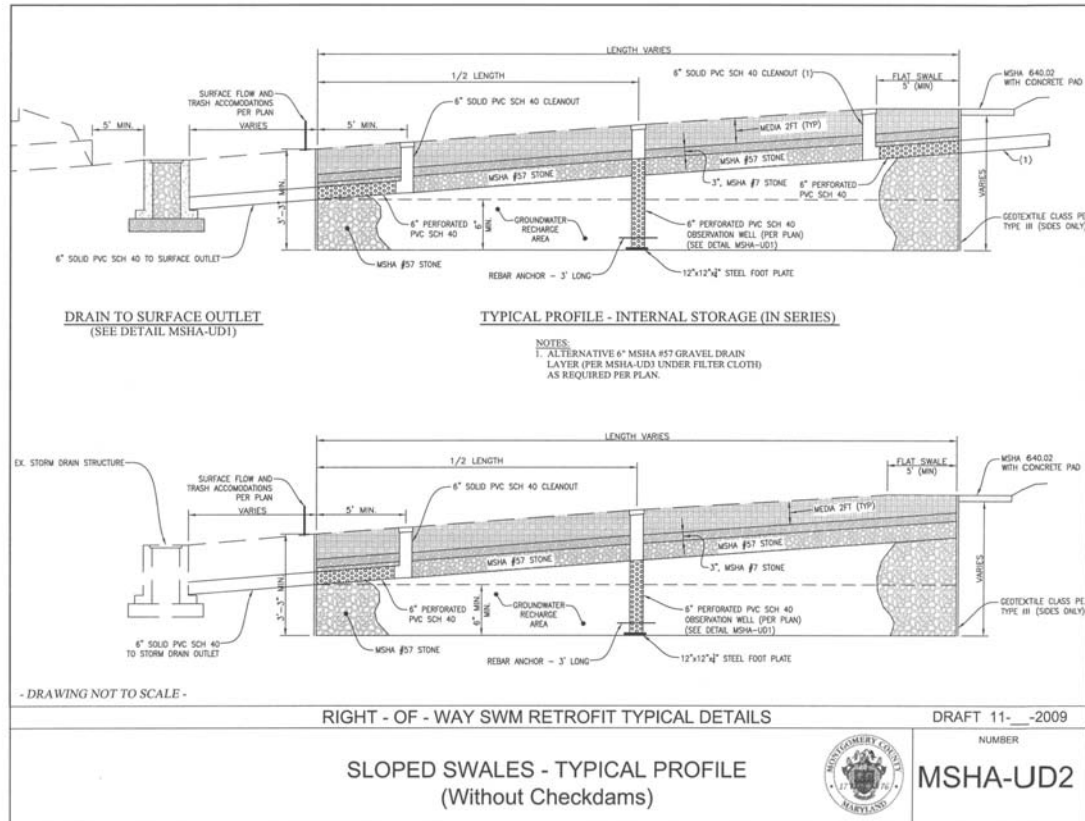
Bioswale Retrofit In Cloverly

Installed By MD-SHA For ICC Environmental Stewardship

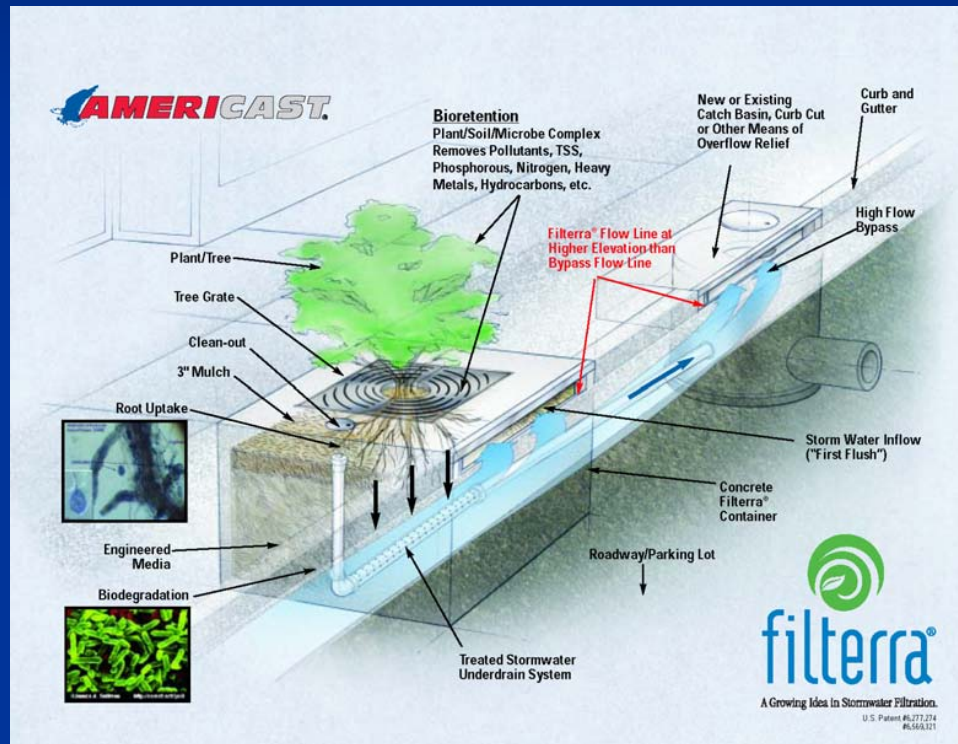


Bioswale Retrofit Along Redmiles Road

Montgomery County Bioswale Design



Tree Boxes



White Oak Library



High Loadings of Trash & Organic Debris to Curb Inlets



Questions ?